

A. AMENDMENTS TO THE CLAIMS

1. (currently amended) A method for detecting a network isolation by a network node, comprising:

receiving a beacon packet from a parent node over a network;

storing an aging indicator for the received beacon packet after an aging interval;

and

indicating a network isolation condition ~~if the beacon packet with the aging indicator is not replaced with~~ reset by a second beacon packet after received from the parent node before a second interval greater than the aging interval.

2. (currently amended) The method of claim 1, the beacon packet comprising a ~~unique source~~ universal destination address for validating the beacon packet.

3. (currently amended) The method of claim 1, said receiving further comprising:
receiving the beacon packet from a neighboring network node other than the parent node; and

~~deleting~~ dropping the beacon data packet received from the neighboring node when the network isolation condition is not indicated.

4. (original) The method of claim 3, further comprising:

transmitting a request to the neighboring network node to register the neighboring network node as a new parent node when the network isolation condition is indicated.

5. (original) The method of claim 4, said transmitting further comprising:
transmitting a discovery message upstream; and
receiving a reply to the discovery message from the neighboring network node on an upstream port.

6. (original) The method of claim 4, further comprising:
receiving an approval from the neighboring network node in response to the request;
deleting a parent status of the parent node; and
storing an indication of the neighboring network node as the new parent node.

7. (original) The method of claim 1, wherein the second interval is at least twice the aging interval.

8. (original) The method of claim 1, further comprising:
continuously receiving a plurality of beacon packets that are individually transmitted by a root node at an interval that is shorter than the predetermined aging interval.

9. (original) The method of claim 1, further comprising:

transmitting the beacon data packet received from the parent network node to all neighboring network nodes.

10. (original) The method of claim 1, further comprising:

receiving a network reconfiguration command; and

selecting a new parent node that is not a descendant node within the network in response to the network reconfiguration command.

11. (currently amended) The method of claim 10, further comprising:

operating in a discovery state after ~~the indication of the network failure condition until the new parent node is identified~~ receiving the network reconfiguration command until an ancestor/descendant relationship is identified.

12. (original) The method of claim 1, said storing performed by a network switching element of a node without any processing by a central processing unit (CPU) of the node.

13. (original) The method of claim 1, the network comprising an Ethernet protocol network.

14. (original) The method of claim 1, the age indicator stored in an age field of a packet address table.

15. (original) The method of claim 1, further comprising:

storing an age indicator for a plurality of stored data packets other than the beacon packet at the predetermined aging interval.

16. (currently amended) A computer readable medium encoded with processing instructions for implementing a method for detecting a network isolation by a network node, the method comprising:

receiving a beacon packet from a parent node over a network;

storing an aging indicator for the beacon packet after an aging interval; and

indicating a network isolation condition if ~~the beacon packet with the aging indicator is not replaced with a second beacon packet after a second interval greater than the aging interval~~ the aging indicator is not reset by a second beacon packet received from the parent node before a second interval greater than the aging interval.

17. (currently amended) An apparatus for detecting a network isolation by a network node, comprising:

means for receiving a beacon packet from a parent node over a network;

means for storing an aging indicator for the beacon packet after an aging interval;

and

means for indicating a network isolation condition if ~~the beacon packet with the aging indicator is not replaced with a second beacon packet after a second interval greater than~~

~~the aging interval~~ the aging indicator is not reset by a second beacon packet received from the parent node before a second interval greater than the aging interval.

18. (currently amended) A method for identifying a network connection failure, the method comprising:

receiving a beacon packet from a parent node over a network, the beacon packet comprising a latest of a series of received beacon packets transmitted at a beacon interval by a root node;

~~replacing a stored beacon packet with the received beacon packet;~~

storing an age indicator for the received beacon packet after an aging interval that is greater than the beacon interval;

~~storing the received beacon packet~~ age indicator until a receipt of a subsequent beacon packet;

~~storing an age indicator for the received beacon packet after an aging interval that is greater than the beacon interval;~~ and

determining a network failure based on the age indicator if the ~~received beacon packet has not been replaced by the subsequent beacon packet after~~ has not been received from the parent node prior to an outage interval that is greater than the aging interval.

19. (original) The method of claim 18, the outage interval being at least twice the aging interval.

20. (currently amended) A method for establishing a self-healing tree network, comprising:

- generating a beacon packet including a unique source address;
- transmitting the beacon packet to a downstream node at an interval that is less than an aging interval used by the downstream node to age the beacon packet, whereby the age of the beacon packet may be used by the a node to determine a network isolation.

21. (currently amended) A method for re-establishing a network connection, comprising:

- determining a network isolation based on an age indicator of a stored beacon packet received from a parent node;
- searching for a new beacon packet from a neighboring node other than the parent node;
- receiving the new beacon packet from the neighboring node; and
- transmitting a registration request to the neighboring node to establish the neighboring node as a new parent node.

22. (original) The method of claim 21, further comprising:

- receiving an acknowledgement of the registration request from the neighboring node; and
- establishing the neighboring node as a new parent node.

23. (currently amended) A method for accepting a child node comprising:

~~transmitting~~ receiving a beacon packet ~~to~~ from a neighboring node;
~~receiving~~ transmitting a registration request ~~from~~ to a neighboring node to
establish the neighboring node as a child node;
transmitting a discovery message on an upstream port to determine if the
neighboring node is an ancestor node; and
~~transmitting~~ receiving an acknowledgement of the registration request if the
discovery message is not later received from the neighboring node.

24. (currently amended) The method of claim 23, said ~~transmitting~~ receiving an
acknowledgement further comprising:

determining whether the neighboring node is an ancestor node based on a stored
address of the neighboring node; and
transmitting the ~~acknowledgement~~ discovery message only when the stored
address is not an ancestor address.